

CAREER GUIDE FOR CIVIL DRAFTERS

Standard Occupational Code: SOC Code: 17-3011.02

Pay Band(s): 2, 3, 4, and 5 ([Salary Structure](#))

Standard Occupational Description: Prepare drawings and topographical and relief maps used in civil engineering projects, such as highways, bridges, pipelines, flood control projects, and water and sewerage control systems.

Civil Drafter positions in the Commonwealth are assigned to the following Roles in the [Engineering Technology Career Group](#):

[Engineering Technician I](#)
[Engineering Technician II](#)
[Engineering Technician III](#)
[Engineering Technician IV](#)

Civil Drafters within the Commonwealth are all located within the Engineering Technology Career Group, individuals may want to pursue other opportunities within the Commonwealth depending upon individual training, education, knowledge, skills, abilities, and interests.

Other Career Group(s) that may be of interest are:

[General Administration](#)

SKILLS, KNOWLEDGE, ABILITIES AND TASKS

(Technical and Functional Expertise)

Skills

Note: The technical and functional skills listed below are based on general occupational qualifications for Civil Drafters commonly recognized by most employers. Typically, you will not be required to have all of the skills listed to be a successful performer. Recruitment and selection standards for an individual state job must be based on the specific knowledge, skills, and abilities for that job as indicated in the job announcement and job description in the Employee Work Profile.

1. Using mathematics to solve problems.
2. Understanding written sentences and paragraphs in work related documents.
3. Identifying complex problems and reviewing related information to develop and evaluate options and implement solutions.
4. Using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.
5. Understanding the implications of new information for both current and future problem-solving and decision-making.
6. Analyzing needs and product requirements to create a design.
7. Communicating effectively in writing as appropriate for the needs of the audience.
8. Monitoring/Assessing performance of yourself, other individuals, or organizations to make improvements or take corrective action.
9. Determining the kind of tools and equipment needed to do a job.
10. Talking to others to convey information effectively.
11. Making Considering the relative costs and benefits of potential actions to choose the most appropriate one.

12. Generating or adapting equipment and technology to serve user needs.
13. Using scientific rules and methods to solve problems.
14. Giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times.
15. Managing one's own time and the time of others.
16. Identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system.
17. Determining how a system should work and how changes in conditions, operations, and the environment will affect outcomes.
18. Adjusting actions in relation to others' actions.
19. Controlling operations of equipment or systems.
20. Conducting tests and inspections of products, services, or processes to evaluate quality or performance.

Knowledge

Note: *The technical and functional knowledge statements listed below are based on general occupational qualifications for Civil Drafters commonly recognized by most employers. Typically, you will not be required to have all of the knowledge listed to be a successful performer. Recruitment and selection standards for an individual state job must be based on the specific knowledge, skills, and abilities for that job as indicated in the job announcement and job description in the Employee Work Profile.*

The Knowledge of:

1. Design techniques, tools, and principles involved in production of precision technical plans, blueprints, drawings, and models.
2. Arithmetic, algebra, geometry, calculus, statistics, and their applications.
3. The practical application of engineering science and technology. This includes applying principles, techniques, procedures, and equipment to the design and production of various goods and services.
4. The prediction of physical principles, laws, their interrelationships, and applications to understanding fluid, material, and atmospheric dynamics, and mechanical, electrical, atomic and sub-atomic structures and processes.
5. Principles and methods for describing the features of land, sea, and air masses, including their physical characteristics, locations, interrelationships, and distribution of plant, animal, and human life.
6. The structure and content of the English language including the meaning and spelling of words, rules of composition, and grammar.
7. Business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods, and coordination of people and resources.
8. Administrative and clerical procedures and systems such as word processing, managing files and records, stenography and transcription, designing forms, and other office procedures and terminology.
9. Raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods.
10. Materials, methods, and the tools involved in the construction or repair of houses, buildings, or other structures such as highways and roads.
11. Principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction.

Abilities

Note: *The technical and functional abilities listed below are based on general occupational qualifications for Civil Drafters commonly recognized by most employers. Typically, you will not be required to have all of the abilities listed*

to be a successful performer. Recruitment and selection standards for an individual state job must be based on the specific knowledge, skills, and abilities for that job as indicated in the job announcement and job description in the Employee Work Profile.

The Ability to:

1. Combine pieces of information to form general rules or conclusions (includes finding a relationship among seemingly unrelated events).
2. Choose the right mathematical methods or formulas to solve a problem.
3. See details at close range (within a few feet of the observer).
4. Add, subtract, multiply, or divide quickly and correctly.
5. Read and understand information and ideas presented in writing.
6. Arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations).
7. Apply general rules to specific problems to produce answers that make sense.
8. Keep your hand and arm steady while moving your arm or while holding your arm and hand in one position.
9. Take fast, simple, repeated movements of the fingers, hands, and wrists.
10. Quickly and accurately compare similarities and differences among sets of letters, numbers, objects, pictures, or patterns. The things to be compared may be presented at the same time or one after the other. This ability also includes comparing a presented object with a remembered object.
11. Listen to and understand information and ideas presented through spoken words and sentences.
12. Imagine how something will look after it is moved around or when its parts are moved or rearranged.
13. Communicate information and ideas in speaking and in writing so others will understand.
14. Make precisely coordinated movements of the fingers of one or both hands to grasp, manipulate, or assemble very small objects.
15. Identify or detect a known pattern (a figure, object, word, or sound) that is hidden in other distracting material.
16. Quickly move your hand, your hand together with your arm, or your two hands to grasp, manipulate, or assemble objects.
17. Tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing there is a problem.
18. Come up with a number of ideas about a topic (the number of ideas is important, not their quality, correctness, or creativity).
19. Remember information such as words, numbers, pictures, and procedures.
20. Know your location in relation to the environment or to know where other objects are in relation to you.

Tasks

Note: *The following is a list of sample tasks typically performed by Civil Drafters. Employees in this occupation will not necessarily perform all of the tasks listed.*

1. Draws maps, diagrams, and profiles, using cross-sections and surveys, to represent elevations, topographical contours, subsurface formations and structures.
2. Drafts plans and detailed drawings for structures, installations, and construction projects, such as highways, sewage disposal systems, and dikes.
3. Plots boreholes for oil and gas wells from photographic subsurface survey recordings and other data, using computer assisted drafting equipment.
4. Finishes and duplicates drawings, according to required mediums and specifications for reproduction, using blueprinting, photographing, or other duplicating methods.

5. Identifies symbols located on topographical surveys to denote geological and geophysical formations or oil field installations.
6. Calculates excavation tonnage and prepares graphs and fill-hauling diagrams used in earth-moving operations.
7. Reviews rough sketches, drawings, specifications, and other engineering data received from civil engineer.
8. Computes and represents characteristics and dimensions of borehole, such as depth, degree, and direction of inclination.
9. Correlates, interprets, and modifies data obtained from topographical surveys, well logs, and geophysical prospecting reports.
10. Accompanies field survey crew to locate grading markers or to collect data required to revise construction drawings.

INTERESTED?

Like people, occupations have traits or characteristics. These characteristics give important clues about the nature of the work and work environment, and give you an opportunity to match your own personal interests to a specific occupation. When you choose a job in an occupation that matches your own interests you have taken an important step in planning a successful and rewarding career.

Civil Drafters' work is called a "Realistic Occupation" because it involves work activities that include practical, hands-on problems and solutions. They often deal with plants, animals, and real-world materials like wood, tools, and machinery. Many of the occupations require working outside, and do not involve a lot of paperwork or working closely with others. It is also referred to as a "Conventional Occupation" since it frequently involves following set procedures and routines. These occupations can include working with data and details more than with ideas. Usually there is a clear line of authority to follow.

LICENSURE, REGISTRATION, OR CERTIFICATION REQUIREMENTS

Generally this is not required for Civil Drafter positions in state government. However, to improve career advancement opportunities, you should consider the advantages of certification and include this step in your self-development plan. *The Civil Drafter occupation is an apprenticeable specialty.* For more information, continue reading the Guide (Educational, Training, and Learning Opportunities).

EDUCATIONAL, TRAINING, AND LEARNING OPPORTUNITIES

1. Graduate from an engineering curriculum accredited by the Accreditation Board for Engineering and Technology.
2. US Military Service
3. On-the-job Training
4. One of the Commonwealth's technical high schools. (Check with your local school district for technical high school information.)
5. Virginia Community College System
6. Talk to a supervisor or supervisor whom you believe "has it all together".
7. Skilled trades organizations that you may wish to join.

8. An instructional program that prepares individuals to apply technical knowledge and skills to plan and prepare scale pictorial interpretations of plans and design concepts for buildings or other structures. Includes instruction in creating layouts and designs, architectural blueprints and renderings, and in the use of computer-assisted design programs.

The Civil Drafter occupation is an apprenticeable specialty. To learn about specific apprenticeship opportunities, please consult the US Department Of Labor, 400 North 8th Street, Federal Building - Suite 404, Richmond, Virginia 23219-23240, (804) 771-2488.

For general information about apprenticeships, training, and partnerships with business, visit the [Office of Apprenticeship Training, Employer and Labor Services \(OATELS\)](#) or the web site for the Virginia Department of Labor and Industry at <http://www.doli.state.va.us>

COMMONWEALTH COMPETENCIES

Competencies are a set of identified behaviors, knowledge, skills, and abilities that directly and positively impact the success of employees and the organization. Competencies can be observed and measured. When consistently demonstrated, competencies make employees particularly effective in their work. Competencies help lay out a road map to career success. You can use the Commonwealth Competencies to help improve your individual performance by adopting behaviors that make high performing employees successful in their jobs. In this way, you can use the Commonwealth Competencies for your further professional development.

The Commonwealth Competencies are:

1. Technical and Functional Expertise
2. Achieve Results
3. Serve the Customer
4. Teamwork
5. Understanding the Business
6. Interpersonal and Communication Skills
7. Leadership and Personal Effectiveness

The above competencies may be applied to employees throughout the Commonwealth of Virginia. They can be rank-ordered by agencies and hiring managers to represent the needs of a specific job. The rank ordering will change depending upon the occupation, an organization's priorities, the actual job requirements, and the supervisor's preferences.

Career success is both about what you do (applying your technical knowledge, skills, and ability) and how you do it (the consistent behaviors you demonstrate and choose to use) while interacting and communicating with others. Hopefully, by studying the Commonwealth competencies, identifying your developmental opportunities, and working to refine your own competence, you can take charge of your career!





For additional information about the **Commonwealth Competencies** go to: http://jobs.state.va.us/cc_planningctr.htm. For the competencies, we first list the competencies and then define each. Finally, we list competency indicators; to describe what successful performance looks like.


COMMONWEALTH CAREER PATH

Career opportunities in the Commonwealth are not limited to moving “up” to the next highest role and pay band, changing positions, or to becoming a supervisor. That’s because most roles describe a broad group of occupationally related positions that perform a range of work that requires increased knowledge and skills. For that reason, Commonwealth roles describe the career paths within the same or higher-level role for the same or different Career Group. The broad salary range and the Commonwealth’s pay practices provide flexibility in recognizing career development and advancement. ([Salary Structure](#))

Many employers, including the Commonwealth, expect trades professionals to gain knowledge, skills, and abilities in more than one area. Multi-skilled workers can add value to the organization and often find that a variety of work assignments can be rewarding.

Sample Career Path

PAY BAND	PRACTITIONER ROLES
2	Engineering Technician I 
3	Engineering Technician II 
4	Engineering Technician III 
5	Engineering Technician IV 



Engineering Technician I

The Engineering Technician I role provides career tracks for engineering technicians who perform or provide assistance to others who perform engineering activities. Duties range from trainee to entry level and are of limited scope and require knowledge of principles/techniques in a specific/narrow area of technical assignment and/or acquired through a formal training program.

Engineering Technician II

The Engineering Technician II role provides career tracks for engineering technicians performing at the journey level who apply technical skills in support of specialized tasks, phases and/or segments of a specialty-engineering project or assignment. Duties include drafting and sketching of engineering plans or maps; conducting on-site bridge/structure and project construction inspections; performing materials sampling and testing; calculating geometrics; or

other specialty activities to ensure accurate program execution and compliance with Department, State and Federal regulations and standards.

Engineering Technician III

The Engineering Technician III role provides career tracks for engineering technicians performing responsibilities ranging from advanced level to supervisory in support of a broad range of engineering specialty activities. Duties involve interpreting engineering guidelines; coordinating varied activities; performing engineering drafting and design work, traffic engineering improvements, materials acceptance evaluations, bridge/structure inspections and construction inspections for moderate to major scale projects; providing technical assistance to others; and performing detailed reviews of engineering related projects. This role also provides career tracks for photogrammetrists who perform entry level to advanced level responsibilities.

Engineering Technician IV

The Engineering Technician IV role provides career tracks for engineering technicians who perform as experts and/or supervisors of technical specialty engineering support and/or coordination of research, planning, design, construction and/or rehabilitation of comprehensive engineering projects and activities. Duties range from ensuring that projects, programs and procedures are effectively and efficiently administered to providing practical technical expertise in making decisions in the review, analysis, coordination and delivery of a specialty engineering function.

ADDITIONAL OCCUPATIONAL INFORMATION CAN BE FOUND AT:

O*NET

<http://online.onetcenter.org/>

Virginia Employment Commission

<http://www.alex.vec.state.va.us/>

Department of Professional & Occupation Regulation

http://www.state.va.us/dpor/conNEW_reg.pdf

Career One Stop

<http://www.careeronestop.org/>

Virginia Career Resource Network

<http://www.vacrn.net/>